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Research Interests

I am broadly interested in design and implementation of mobile systems and their applications. My research touches various areas including wireless networking, security, and large-scale distributed systems.

Education

- **University of Massachusetts, Amherst** Amherst, MA
Ph.D. Candidate in Computer Science Sep. 2007 - present
- **Carnegie Mellon University** Greece/U.S.A
M.S. in Information Networking Sep. 2005 - Dec. 2006
- **Sharif University of Technology** Tehran, Iran
B.S. in Computer Engineering Sep. 2000 - Feb. 2005

Research Experience

- **University of Massachusetts, Amherst, PRISMS Lab** Amherst, MA
Research Assistant. Advisors: B. Levine & M. Corner Sep. 2007 - Present
 - Concurrent Wi-Fi connections for highly mobile networks.
 - Patching connectivity holes in mobile networks using long-ranged low-power radios.
 - Digital image enhancement using a vehicular image capturing platform.
 - Involved in development, analysis, and evaluation of DOME, a city-wide mobile network.
- **Raytheon BBN Technologies, GENI Project Office** Cambridge, MA
Summer Intern. Advisor: H. Mussman Jun. 2011 - Sep. 2011
 - Software development for and performance evaluation of a wide-area programmable WiMAX infrastructure which is to be part of the next generation of GENI.
- **Athens Information Technology Institute, Algorithms & Security Lab** Athens, Greece
Research Assistant. Advisor: T. Dimitriou. Jan. 2006 - Jul. 2007
 - Authenticated aggregation in dynamically clustered hierarchical wireless sensor networks.
 - Energy-efficient scheduling in a sensor network of nodes with multiple directional antennas.
 - Development of a sensor network environmental monitoring platform as part of a program to protect the endangered Caretta-Caretta turtles in Zakynthos Island with support of WWF Hellas.
 - Light-weight energy-efficient encryption algorithm suitable for low-power devices.
 - Platform for real-time secure interaction with sensor networks.
- **Sharif University of Technology** Tehran, Iran
Undergraduate Researcher. Advisors: S. Bagheri, & J. Habibi Sep. 2001 - Feb. 2005
 - Defining T-Norm & S-Norm fuzzy operators based on natural diffusion.
 - Studying problems of employing classical logic in modeling human reasoning.
 - Primary studies in image processing and system planning for small-sized soccer player robots.
 - Development of an autonomous multi-agent system of virtual soccer players.

Work Experience

- **Intralot Co.** Athens, Greece
Software Developer Nov. 2006 - Jul. 2007
 - Development of a security system for distributed mobile phone games.

- **Nebras Informatics Co.** Tehran, Iran
Analyst, Software Designer & Implementer *Jun. 2003 - Jun. 2005*
 – Design and implementation of Phone Call Pager, a distributed CORBA application under Windows.
- **Danesh Pajouhan Co.** Tehran, Iran
Systems Analyst *Jun. 2002 - Sep. 2002*
 – Responsible for analysis phase of a system utility software to be used by computer engineering students as an aid to their course studies.
- **Sharif Computing Center** Tehran, Iran
Software Developer *Sep. 2001 - Jun. 2002*
 – Web designer and developer in Sharif Virtual University project.
 – Design of a secure system for Hadi Systems to protect its audio/visual products from being captured.

Teaching Experience

- **Instructor** Amherst, MA
C/C++ *Aug. 2009 - Aug. 2010*
 – Teaching C/C++ to a group of graduate students in UMASS, Amherst studying in majors other than computer science. This has been a voluntary work.
- **Teaching Assistant** AIT, Greece
Graduate Courses *Jan. 2006 - May 2007*
 – Computer & Network Security (Tutor: T. Dimitriou), Spring 2007
 – Operating Systems (Tutor: S. Efreimidis), Spring 2006, Spring 2007
 – Web Technologies (Tutor: T. Tiropanis), Fall 2006
- **Instructor** Tehran, Iran
Introduction to Computer Science *2005*
 – Teaching basics of algorithms, data structures & C programming language to top selected high school students of Tehran First Educational Region as part of the program held by both Sharif University of Technology & National Ministry of Education.
- **Instructor** Tehran, Iran
Introduction to Computer Science *2004*
 – Teaching at Farzanehgan (part of the National Organization for Development of Exceptional Talents).

Publications

- H. Soroush, P. Gilbert, N. Banerjee, B. Levine, M. Corner, L. Cox, “Concurrent Wi-Fi for Mobile Users: Analysis and Measurements”, ACM CoNEXT’11, December 2011.
- H. Soroush, P. Gilbert, N. Banerjee, B. Levine, M. Corner, L. Cox, “Improving Mobile Networking with Concurrent Wi-Fi Connections”, ACM SigComm’11, Poster Session, August 2011 (Extended versions available at UMass UM-CS-2011-016 and UM-CS-2009-041 Technical Reports).
- H. Soroush, N. Banerjee, M. D. Corner, B. N. Levine, “Patching Mobile WiFi Networks”, Currently Under Review, 2011 (Older version available as UMass UM-CS-2009-039 Technical Report)
- H. Soroush, N. Banerjee, M. D. Corner, B. N. Levine, B. Lynn, “A Retrospective Look at the UMass DOME Mobile Testbed”, to appear in ACM SigMobile MC²R, 2011 (An older version available as UMass UM-CS-2009-023 Technical Report).
- H. Soroush, A. Gosain, H. Mussman, “WiMAX Experiments Using OMF/OML”, NSF GENI Engineering Conference (GEC ’11), Poster/Talk, June 2011.
- H. Soroush, R. Wang, B. N. Levine, M. D. Corner, ”Digital Image Enhancement Using a Vehicular Image Capturing Platform”, UMass UM-CS-2011-02 Technical Report, Jan 2011.

- H. Soroush, N. Banerjee, A. Balasubramanian, M. D. Corner, B. N. Levine, B. Lynn, “Dome: A Diverse Outdoor Mobile Testbed”, in the 1st ACM International Workshop on Hot Topics of Planet-scale Mobility Measurements (ACM HotPlanet ’09), held in conjunction with ACM MobiSys, Krakow, Poland, June 2009.
- I. Krontiris, T. Dimitriou, H. Soroush, M. Salajegheh, “WSN Link-layer Security Frameworks”, book chapter of ”Wireless Sensor Network Security”, Edited by Jianying Zhou and Javier Lopez, ISBN 978-1-58603-813-7, 2008.
- M. Salajegheh, H. Soroush, A. Kalis, “HyMAC: Hybrid TDMA/FDMA Medium Access Control Protocol for Wireless Sensor Networks”, in the 18th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC’07), Athens, Greece, September 2007.
- N. Komninos, H. Soroush, M. Salajegheh, “LEE: Lightweight Energy-efficient Encryption Algorithm”, in the Ninth International Symposium on Communication Theory and Applications (ISCTA’07), Ambleside, Lake District, UK, July 2007.
- H. Soroush, M. Salajegheh, T. Dimitriou, “Providing Transparent Security Services to Sensor Networks”, in IEEE International Conference on Communications (ICC’07), Glasgow, Scotland, June 2007.
- M. Salajegheh, H. Soroush, A. Thomos, T. Dimitriou, I. Krontiris, “.Sense: A Secure Framework for Sensor Network Data Acquisition, Monitoring and Command”, in the ACM Workshop on Real-World Wireless Sensor Networks (REALWSN06), Poster Session, June 2006.
- H. Soroush, M. Salajegheh, T. Dimitriou, “Securing Hierarchical Sensor Networks”, Master of Information Networking Thesis, Information Networking Institute, Carnegie Mellon University/Athens Information Technology, November 2006.
- H. Soroush, S. B. Shouraki, “A Critical Analysis of Classical Reasoning Systems & Defining New Fuzzy Operators Based on Diffusion Phenomena in Nature”, Bachelor of Science Thesis, Department of Computer Engineering, Sharif University of Technology, January 2005.

Technical Skills

Languages: C/C++, Java, Ruby, Unix Shell, SQL, nesC, MATLAB, R, L^AT_EX

Embedded Systems: Familiarity with NFC, Android OS, TinyOS, MSP-based and AVR microcontrollers, ARM Processor (mainly XScale), Mica2 & tmoteSky motes, GPS, CC2420, Wi-Fi, and 900MHz Digi-Xtend Radios, MadWiFi Driver, CHDK and hacking Cannon Cameras, Prosilica Cameras, Linux Kernel hacking.

Web Development: PHP, Servlets, JSP, Applets, Java Script, HTML & XML, MySQL, .Net Platform, ASP, Macromedia Flash MX and Adobe PhotoShop.

Achievements and Activities

- Graduate Student Senator in UMASS Graduate Student Senate From Fall 2009 to Spring 2011.
- Responsible for Computer Science Departmental Movie Nights from Fall 2008 to Fall 2010.
- Student Travel Grants: NSDI’09, SIGCOMM’11.
- Ranked in top five master students, Athens Information Technology (AIT), Athens, Greece, 2007.
- Awarded of with full tuition scholarship from Athens Information Technology (AIT), Athens, Greece, 2005.
- Ranked 5th with Sharif Aras Team in the first international Robocup German Open Soccer Simulation League in Paderborn, Germany, 2001.
- Recipient of financial award from Sharif University of Technology for the high rank in Nationwide Examination for Undergraduate Admissions in the Public Universities, Iran, September, 2000.
- Ranked among 0.04% of more than 350,000 students participating in the Math Section of the Nationwide Examination for Undergraduate Admissions to the Public Universities, Iran, May 2000.